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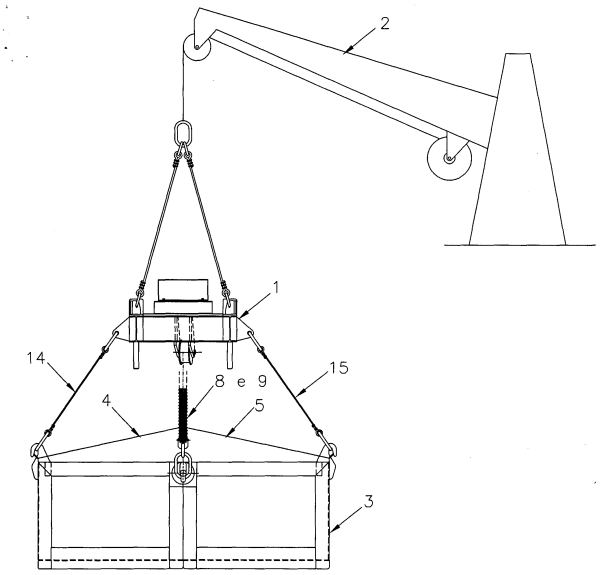
(54) AUTOMATED DEVICE FOR OPENING AND CLOSING METAL GOODS-TRANSPORTATION BOXES FOR STOWAGE ON SHIPS

(57) Abstract of invention AUTOMATED DEVICE FOR OPENING AND CLOSING METAL GOODS-TRANSPORTATION BOXES FOR STORAGE ON SHIPS. It's an automated device for opening and closing metal goods - transportation boxes for storage on ships, eliminating the necessity from silos of storage next to the platform of harbour and as well the conveyor belts and yours accessories to the loading of ship, being formed of specials boxes (3), automatic spreader (1), mobile cables (8) and (9), set of lids (4) and (5), the equipment discloses productivity gains in using as fast in operation, eliminates the human presence in the basement of ship, because the control of down and up of boxes is accomplished through the automatic "spreader" that is connected to distance through the central of control.

FIGURE 1



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Description

[0001] It refers to the present invention called AUTOMATED DEVICE FOR OPENING AND CLOSING METAL GOODS-TRANSPORTATION BOXES FOR STORAGE ON SHIPS, eliminating the necessity of storage silos next to the platform of harbour and in the same time the conveyor belt and accessories for carrying in the ship. Nowadays the products as grains, fertilizers and similars are loaded on the ships through large structures of cargo handling in the harbour as the silos and conveyor belt, occupying a large area for storage and handling of these products. Alternatively the exporters stock the goods in far locations from harbours.

PRIOR ART

[0002] The storage out of harbours requires from exporters the handling and transporting of these products in bags or containers, limiting thus the transportation of the goods to the ships with appropriate characteristics for this kind of transport in folding boxes from difficult operation. In the conventional method these boxes are loaded in the stockyard of exporter and has been taken on trucks until the harbour and then these are hoisted from crane of ship through two central lugs connected with the cable crane. Then it is taken to the basement of ship, supported in the bottom of basement or on another cargo already wrapped and then an operator repositions these cables of lifting fixing them in the lugs of the box ends to the crane of ship promotes the openness to hoist it again.

[0003] This method takes time to repositioning of lift cables from box so that it can open. This conventional method has still the inconvenience of a necessity from an operator.within of the basement from ship to reposition the lift cables, that is a risk operation, and the box needs to be supported in the loading to the operator can make the repositioning of these cables.

[0004] There's not possibility to close this box within of basement from ship too, because it would need to be supported on the cargo to reposition the cables which would lead to the entry of product again in the box at the moment to close. As this box leaves opened the basement may occur the contamination of docks harbour for waste aggregate products that detach from box during the movement of returning from box to the truck.

[0005] The Automated Device for Opening and Closing Metal Goods-Transportation Boxes for Storage on Ships eliminates for all the difficulties above presented of conventional method, being related according the drawings attached where:

The DRAWING 01: Discloses a side view of the Automated Device for Opening and Closing Metal Goods-Transportation Boxes for Storage on Ships in the rest position.

The DRAWING 02: Discloses a side view of the Automated Device for Opening and Closing Metal Goods-Transportation Boxes for Storage on Ships in operation.

The DRAWING 03 Discloses a front view from box with the closed lids..

The DRAWING 04 Discloses a superficial view of box, highlighting the pistons set; The DRAWING 05: Discloses a front view of box with the lids opened.

The DRAWING 06: Discloses one

The DRAWING 07: Discloses detail design of rip where pass it that will hoist the lids.

[0006] As can be seen in the drawings the Automated Device for Opening and Closing Metal Goods-Transportation Boxes for Storage on Ships is formed by a set of mobile lids (4); (5), which functions will be observed in this report.

[0007] The automatic "spreader" (1) has two cylinders (6) and (7) parallel transverse mounted between them according the drawing 2. with a pulley in each extremity of yours rods with the objective to bend the course of the cable of lifting or down (Drawing 2).

[0008] These cylinders make the operation of opening and closing of box and the're driven by a hydraulic pump connected to a combustion engine or electric.

[0009] Optionally this system can be built with an engine reducer and steel cable drum, substituting thus the hydraulic cylinder. The opening of box occurs with downing of cables (8) and (9), while the closing of the same occurs with rising of the same cables (8) and (9).

[0010] The boxes disclosed in the drawings 3, 4 and 5 attached, close with hoisting of cables (8) and (9), that are connected to them in the middle of boxes in the items (10) and (11) and open with your downing. There're two cables (14) and (15) that connect the boxes in yours two others ends (12) and (13) and these cables stretch and start to pull in the downing of the two central cables (8) and (9), that leave to pull after downing time and cause thus the opening of box as viewed in the drawing 6. Thus the material flows by gravity through the sloping surfaces formed without leaving any waste adhered in the boxes.

[0011] The lids of two boxes (4) and (5), that open a little in the opening of the same and closing completely in the rising of cables (8) and (9) that cause too the consequent closing of the boxes. There're rips in these lids to avoid the contact with the cables (14) and (15) connected to the ends (12) and (13).

[0012] In the automatic "spreader" (drawing 2) are located the hydraulic systems (6) and (7), engine and pumps, thus the movement of cables (8) and (9) is carried out by remote button press far and that down the cables or rising. In the downing of cables (8) and (9) inside of ship, after a time the cables (14) and (15) are then pull

and the (8) and (9) relax. Thus the boxes are opened and emptying as can be seen in the drawing 6. In the rising of cables (8) and (9) the boxes close completely, including the lids (6) and (7) in the same time close and the box is removed from ship by the bridge of ship.

[0013] As can be observed in the text above, the equipment called "spreader" automatic (1) controlled by remote control that execute the operations of opening and closing of the boxes (3) in any place that they were, being the same hoisted by the crane of ship (2) that pass to have the single function of hoisting and downing the boxes set (3) and the "spreader"(1). With Automated Device for Opening and Closing Metal Goods-Transportation Boxes for Storage on Ships, there's no necessity of maintaning an operator inside of basement and eliminating the necessity of box support in the bottom of basement or in the own cargo of ship to execute the opening or closing of box and it exits closed and clean from the basement of ship and thus eliminates any contamination from platform of harbour as in any other environment. The time of operation is so much reduced with this method, increasing in this way the productivity of operation in the loading.

Claims

1. AUTOMATED DEVICE FOR OPENING AND CLOSING METAL GOODS-TRANSPORTATION BOXES FOR STORAGE ON SHIPS, **characterized by** using automatic "spreader" and specials boxes. In the automatic "spreader" we have the hydraulic/mechanic system that rise or downing the cables (8) and (9). Downing the cables (8) and (9) we have the final consequence of boxes opening through the cables (14) and (15) of drawing 6 that are pulled, while the cables (8) and (9) are slightly loose and leaving to pull the points (10) and (11) from boxes (3). Thus the product contained in the boxes drips by the lower sloping surfaces of boxes and they not leave residues in these boxes. When the cables go up (8) and (9), these are pulled, while the cables (14) and (15) relax and failing to pull. By the opposite movement to the previous, the boxes close completely and then are removed from ship.

2. AUTOMATED DEVICE FOR OPENING AND CLOSING METAL GOODS-TRANSPORTATION BOXES FOR STORAGE ON SHIPS according the claim 1, **characterized by** mobile lids (4/5) that move slightly in the opening of boxes and after are closed completely in the rising of boxes.

3. AUTOMATED DEVICE FOR OPENING AND CLOSING METAL GOODS-TRANSPORTATION BOXES FOR STORAGE ON SHIPS according the claim 1, **characterized by** rip of rip, that pass by the cables (14) and (15) without touching during the movement of lids;

4. AUTOMATED DEVICE FOR OPENING AND CLOSING METAL GOODS-TRANSPORTATION BOXES FOR STORAGE ON SHIPS according the claims 1 and 2, **characterized by** hydraulic cylinders (6) and (7) operated through engine explosion and that moves the oil pump for moving the existing hydraulic pistons in each cylinder and that move the cables (8) and (9), up or down, according remote control from a distance. This is a system to down and moving metal chains of steel or cables through two pulleys, one for each cylinder and located in the sides of automatic "spreader".

5. AUTOMATED DEVICE FOR OPENING AND CLOSING METAL GOODS-TRANSPORTATION BOXES FOR STORAGE ON SHIPS according the claims 1 and 2, **characterized by** a drive system (electric motor or explosion of fuel) that connected directly or through the reduction speed gearbox to this to movement of steel cables or chains in another direction (to up and down through pulleys or directly).

FIGURE 1

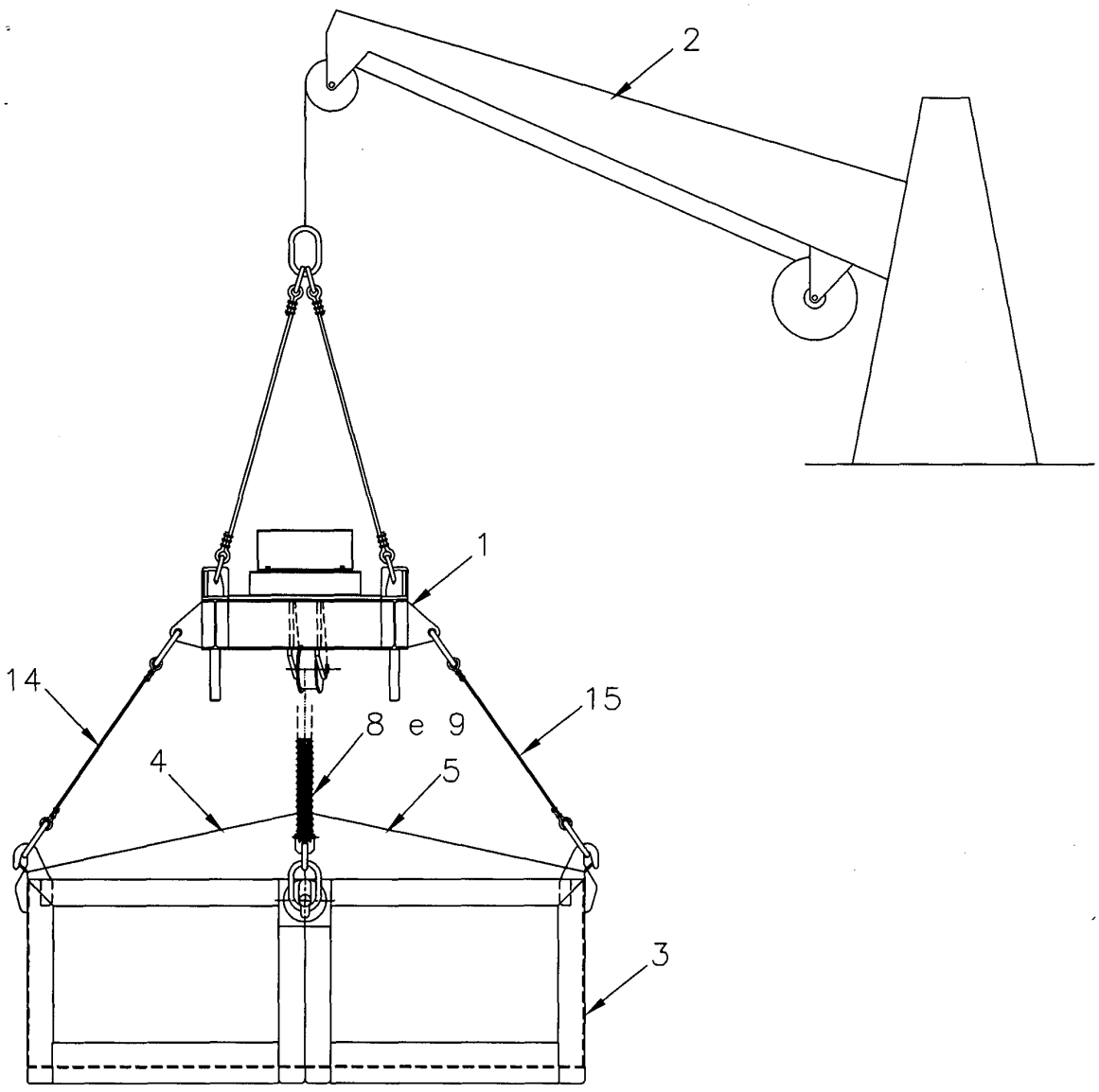
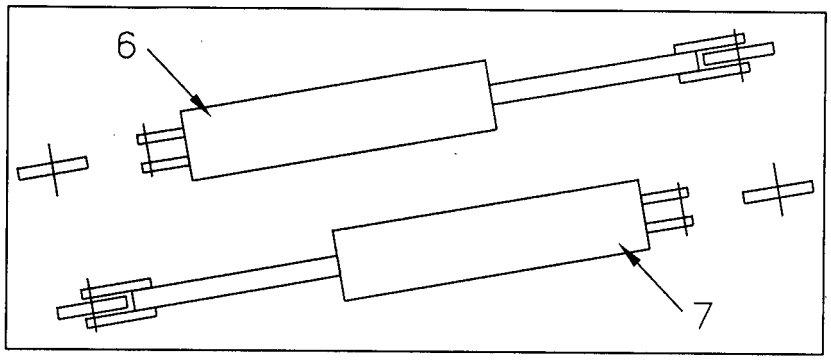


FIGURE 2



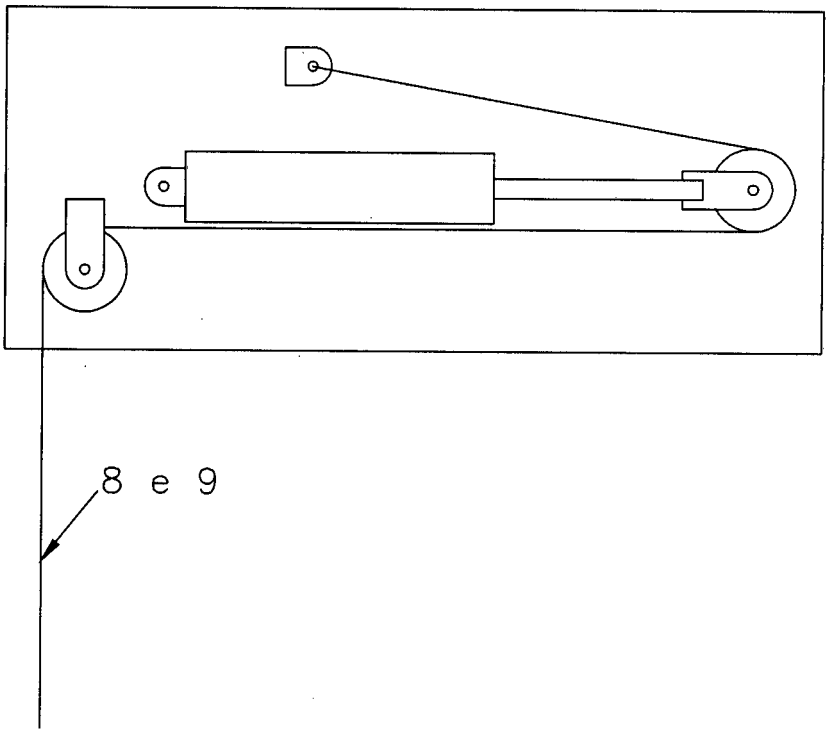


FIGURE 3

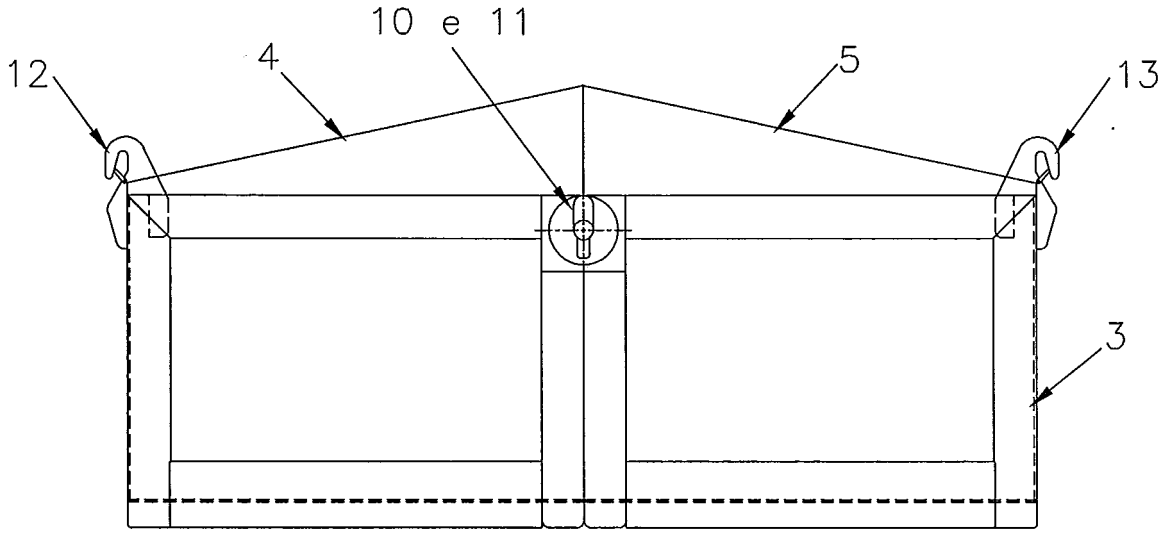


FIGURE 4

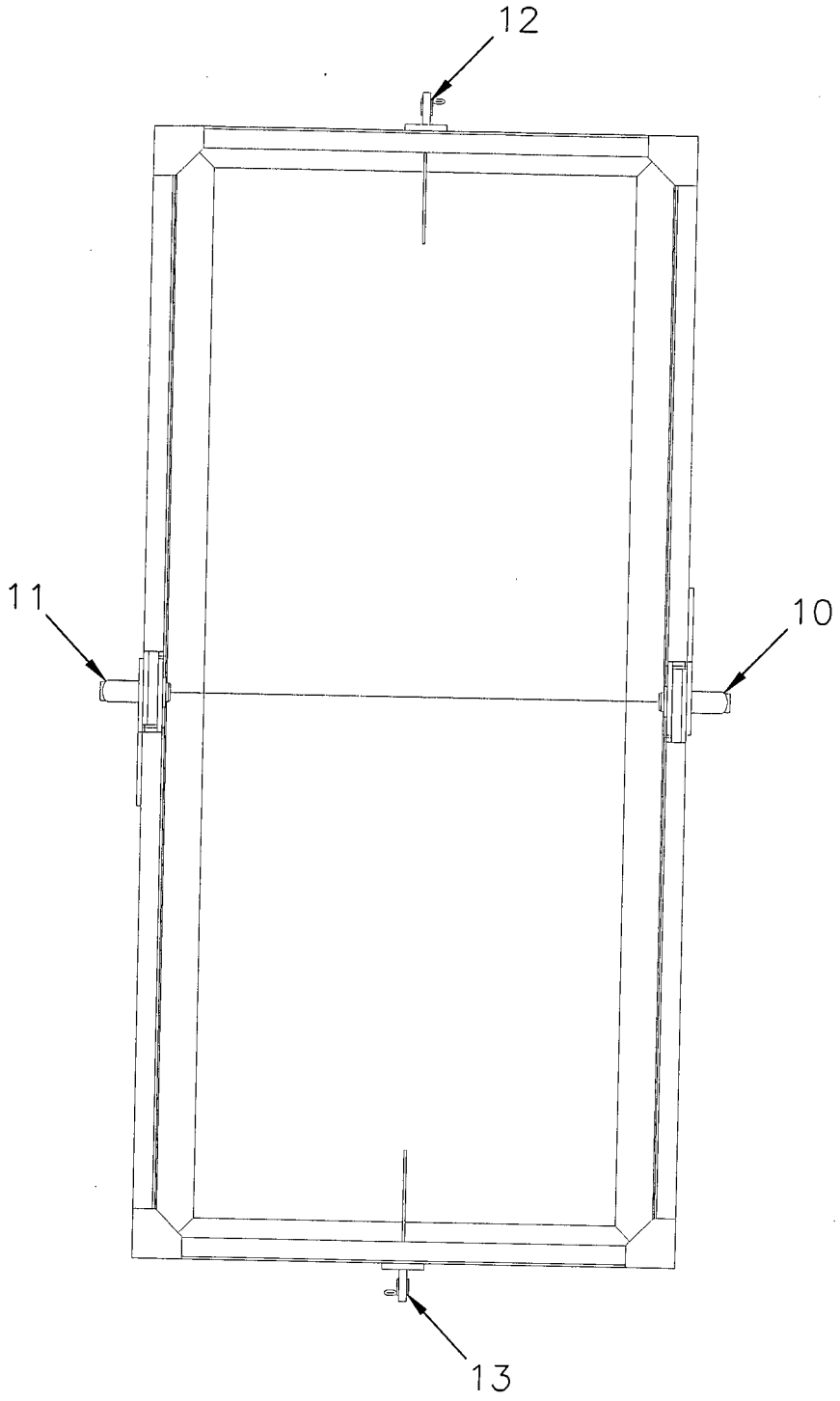


FIGURE 5

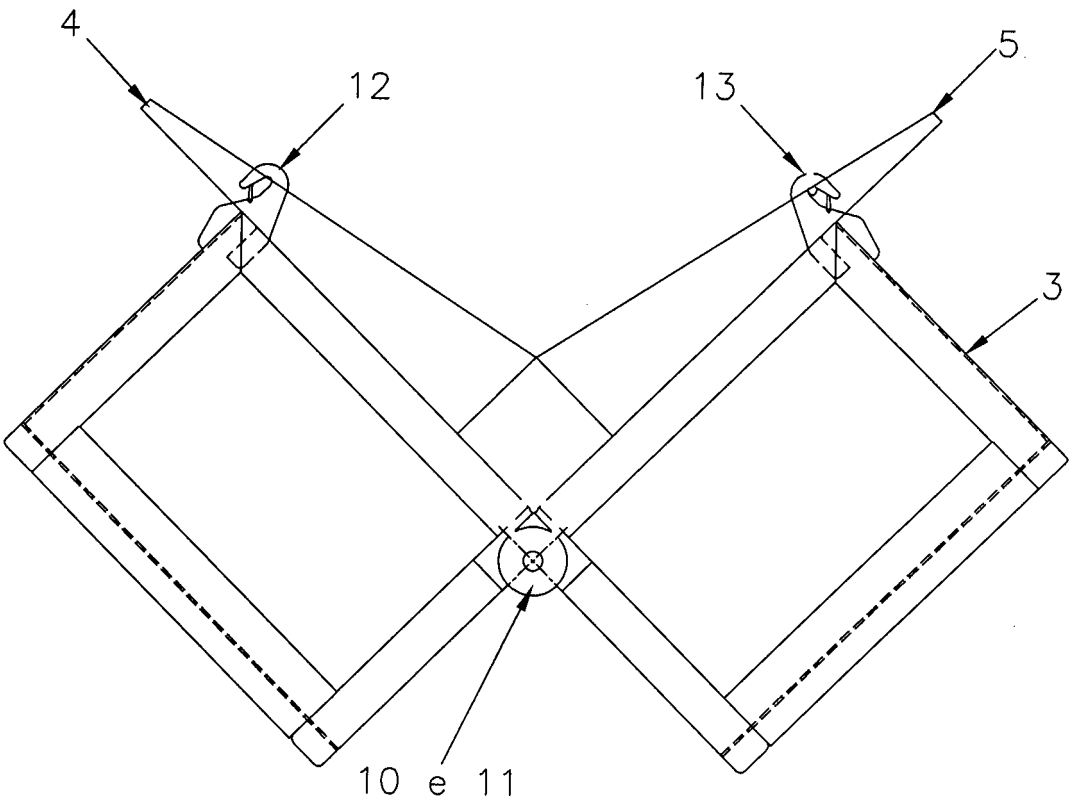


FIGURE 6

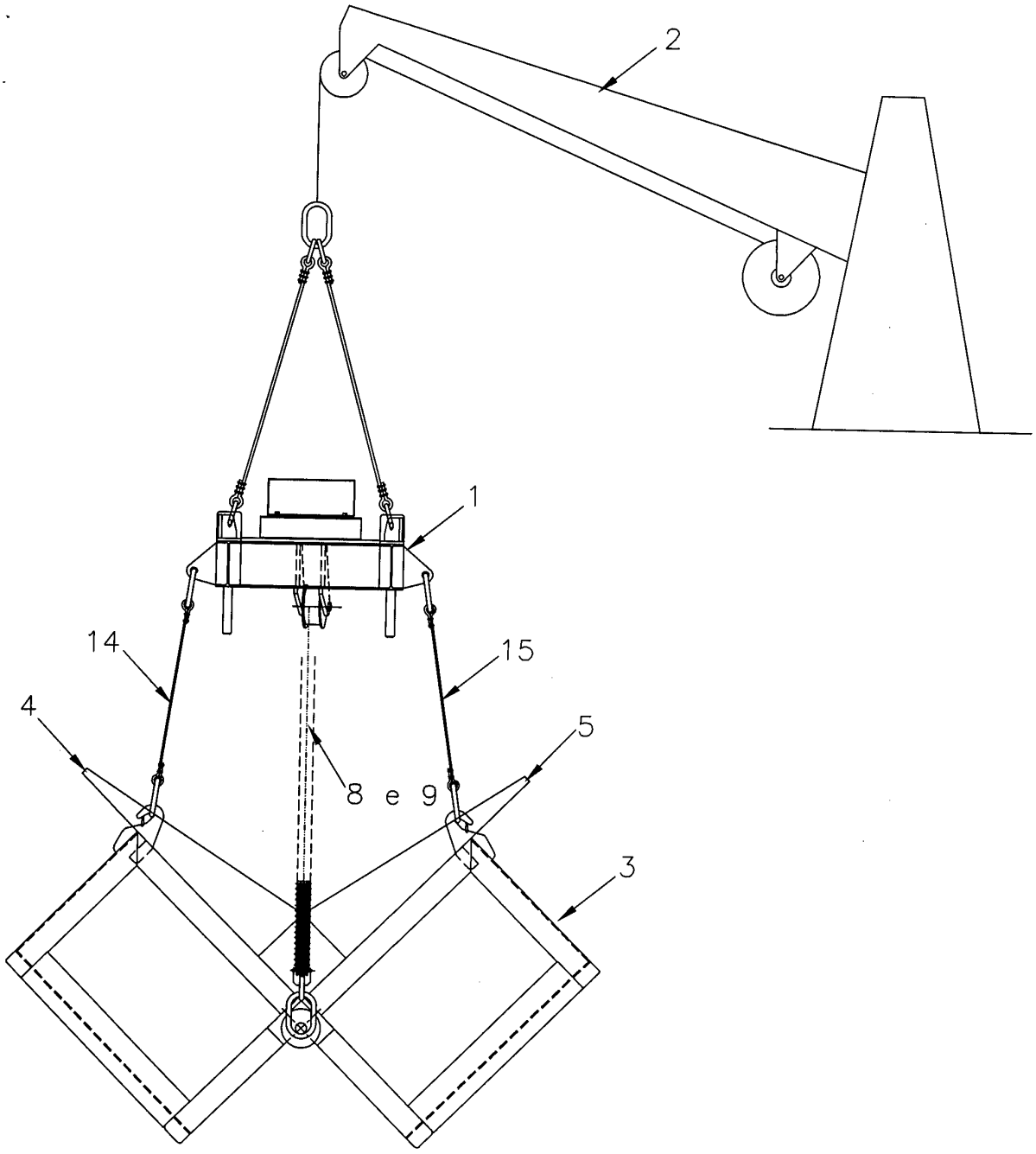
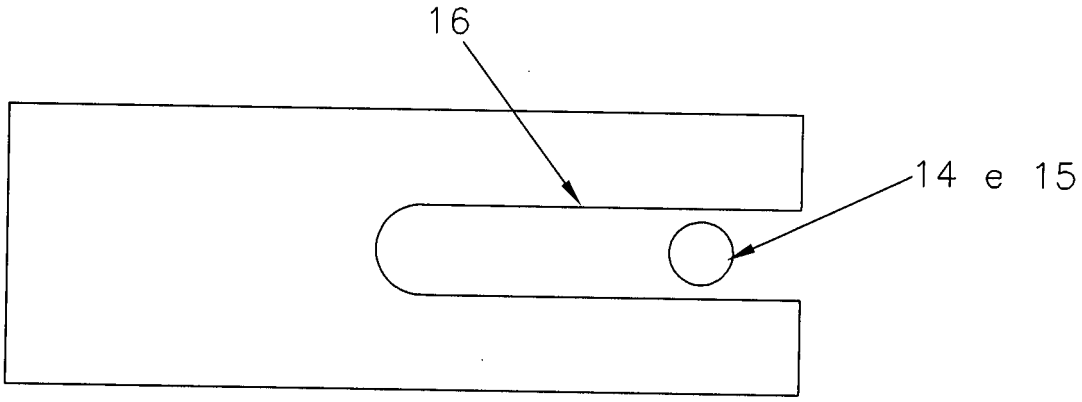


FIGURE 7



INTERNATIONAL SEARCH REPORT

International application No.
PCT/BR2013/000032

A. CLASSIFICATION OF SUBJECT MATTER
B63B25/02 (2006.01), B65D90/10 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B63B; B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Banco de Patentes Brasileiro - INPI-BR, (SINPI), GOOGLE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

ESPACENET, EPODOC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 19603998 A1 (KRUSE HERMANN DIPL ING [DE]) 14 **august**, 1997 (1997-08-14)	1 a 5
A	DE 10023436 A1 (TAX TECHNICAL CONSULTANCY GMBH [DE]) 15 **november**, 2001 (2001-11-15)	1 a 5
A	DE 102004018072 A1 (FALLER ALEXANDER [DE]) 27 **october** 2005 (2005-10-27)	1 a 5

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents:
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
15/04/2013	17 04 13
Name and mailing address of the ISA/ INPI — INSTITUTO NACIONAL DA PROPRIEDADE INDUSTRIAL, Rua Sao Bento nº 1, 17º andar, cep: 20090-010, Centro - Rio de Janeiro/RJ, Facsimile No. +55 21 3037-3663	Authorized officer **Joaquim Aderito Correia de Moura**, Telephone No. +55 21 3037-3493/3742

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/BR2013/000032

DE 19603998 A1	1997-08-14	None	
DE 10023436 A1	2001-11-15	None	
DE 102004018072 A1	2005-10-27	None	

Form PCT/ISA/210 (patent family annex) (July 2009)